

APPLICATION FOR UNITED STATES LETTERS PATENT

Applicant:

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For:

**“Automatic Configuration of Reinstall
Information”**

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AUTOMATIC CONFIGURATION OF REINSTALL INFORMATION

TECHNICAL FIELD

The field of the invention is that of computer systems, in particular systems that have provision for recovery of damaged files.

BACKGROUND OF THE INVENTION

In modern computer systems, a number of user desktop systems are connected to a network that includes at least one server that performs various functions such as electronic mail, distributing updates, etc.

When a user system crashes and the hard disk contents are lost, the system needs to be reinstalled. In an environment where many different configurations and types of systems are installed, this usually requires a specific operating system and application image to be placed on a server for reinstallation if necessary. This creates the need for huge amounts of storage to hold these large images. It would be advantageous to require employ a storage method that requires significantly less disk space.

When a user system crashes and the hard disk contents are lost, the operating system and data needs to be reinstalled on that particular computer.

1 In an environment where many different configurations and types of
2 systems are installed, this usually requires a specific operating system and
3 application image to be placed on a server for reinstallation if necessary.
4 This creates the need for huge amounts of storage to hold these large
5 images.

6 Some systems require each user to conform to a standard image, but
7 that prevents the user from using appropriate software.

8 It would be advantageous to not store the specific images for each
9 configuration, but to store instead a reduced volume of data that could
10 reproduce the individual user's (non-standard) configuration.

11 SUMMARY OF THE INVENTION

12 The present invention relates to a method and apparatus for the
13 automatic reinstallation of the configuration of a workstation in a multi-user
14 computer system.

15 A feature of the invention is the storage of a small file of parameters
16 specifying what software is to be installed on a user's computer system.

17 Another feature of the invention is a monitor program that monitors
18 the installation process on a user's system and records the choices made by
19 the user.

1 BRIEF DESCRIPTION OF THE DRAWINGS

2 Figure 1 illustrates a block diagram of the present invention.

3 Figure 2 illustrates a block diagram of an alternative version of the
4 present invention.

5 DETAILED DESCRIPTION

6 The problems described above of requiring massive mounts of
7 storage to provide adequate backup capability for individual users in a
8 multi-user system would be improved if the system did not store the specific
9 images for each configuration, but did store instead a procedure or script
10 that would install the specific configuration from a single instance of the
11 system.

12 This would result in a considerable saving in which the server did not
13 have to store N copies of the kernel of an operating system, but instead
14 stored a single copy and, for each user, a much smaller file listing the
15 modules that are and are not included in the particular configuration and
16 various parameters required to specify the modules. For convenience in the
17 claims, the term "backup non-specific copies" will be used to indicate the
18 reference copy of the operating system or application program. The term
19 "non-specific" indicates that parameters chosen by a particular user are not
20 included in that copy - e.g. they have the factory defaults.

21 In operation, each user would have an associated specification, which

1 may be a simple list of the final configuration or preferably a procedure or
2 script that would be executed to install the specific configuration from a
3 single instance of the system. This approach would require significantly less
4 disk space.

5 Referring to Figure 1, there is shown a block diagram of a system
6 according to the invention, comprising server 104 connected to user system
7 101. Other user systems are indicated schematically by box 101-n. In this
8 example, agent 102 of the present invention monitors the initial installation
9 of the operating system on user system 101 and builds a response file
10 consisting of the inputs provided during the initial operating system
11 installation. This response file is saved to storage 103 or server 104.

12 For example, the vendor's configuration program may ask: "Do you
13 want to install module X?" The monitor program would record the answer
14 and store it. The list of standard modules in that particular version of the
15 operating system would already have been stored.

16 The agent also monitors the installation of all applications, noting the
17 file names, where they are placed, and inputs and responses to installation
18 questions, saving this information to storage 103 or server 104.

19 In one implementation of the present invention, the administrator or
20 installation technician installs the agent on computer system 101 and then
21 installs the operating system. During installation, the settings used for the
22 installation are recorded to the hard disk 103 for later processing.
23 Subsequent installations of applications on the computer system 101 are
24 also recorded, along with their settings.

1 This incremental recording is then merged with the previous
2 recording and combined into a backup script that is used to install the
3 system on a new computer or one that has had the hard disk drive replaced.
4 This script is then saved to a persistent storage device such as a hard disk,
5 floppy disk, CD, or any other type of persistent storage 103 or server 104.

6 For example, the vendor of the operating system software typically
7 supplies an installation program that presents the user with a series of
8 choices: - accept the default installation or perform a custom installation.
9 The software agent would record the choices made by the user - e.g. 1)
10 accept the standard installation; 2) accept the standard installation, except
11 substitute a different browser; 3) accept the standard installation, except
12 substitute a different suite of productivity programs, etc.

13 Once the choices have been recorded, the agent could, at the
14 appropriate time, simply wait for the vendor's installation program to make
15 the requests and play back the user's recorded responses or it could
16 summarize the responses and actively direct the server to install the desired
17 programs without going through the time required to wait for the vendor's
18 installation program to make a request and then reply to it.

19 Although the recording process above is very convenient, there are
20 other ways of collecting the information to be stored. For example, the user
21 could be required to specify at some convenient time the desired
22 configuration, which the local computer support group will later install.
23 That specification data could also be used as the basis of the storage file; i.e.
24 if and when a backup is needed, the support group would access the storage
25 file and go through the same process to re-install the desired configuration.

1 In another implementation, suitable for use on existing systems, the
2 present invention takes a snapshot of the current system environment on the
3 computer system 101 and, based on the configuration, builds a response file
4 to be used to reinstall the system fresh and saves the response file to storage
5 103 or server 104.

6 This implementation has a further option to upgrade any installed
7 applications, device drivers, or system components to their latest version.

8 This implementation aids in migration as it allows the user's current
9 configuration to be upgraded and migrated at the same time. The
10 information regarding the installed programs is then used to migrate the data
11 associated with the migrated applications.

12 This step may require that the data files be converted or upgraded to
13 be used with the newer versions of the installed applications. If conversion
14 or upgrades to the data are required, that operation can be performed at the
15 same time that the applications are migrated.

16 The scripts are saved as described above, and additionally, the user's
17 data and configuration files are then copied to storage 103 or server 104.

18 Figure 2 shows an alternative embodiment of the invention. Once the
19 user information is collected and saved, this information can be used to
20 migrate the current computer system 101 to a new computer system. The
21 agent of the present invention 102 is installed on the new or repaired
22 computer system 101'. The agent then queries storage 103 or server 104 for
23 the installation script. The agent 102 then processes the script to rebuild the
24 computer system 101.

1 The agent 102 queries the storage 103 or server 104 for the software
2 to install, including operating system, device drivers, and applications.
3 Depending on whether or not the user indicated (or the relevant information
4 system organization requires) that the newest version of certain programs
5 should be installed, the operating system and application images may be
6 loaded from storage 103, server 104, or from an internal or external web site
7 105.

8 Alternatively, management of the information technology function in
9 the organization could set parameters on the user's discretion - e.g. some
10 non-supported programs, whether operating systems or applications, will
11 not be upgraded even if the user has requested an upgrade.

12 The use of the present invention does not require that the local
13 support group will grant a blank check to the users. A user who insists on
14 using an obsolete program or a highly specialized program that is not
15 supported by the support group may or may not be covered by a process
16 according to the invention. For example, the support group could arrange
17 with the users that files in a specified directory(ies) will be backed up and
18 restored in the event of a disk crash, regardless of whether the files are data
19 or non-supported programs. Alternatively, the support group could have an
20 approved list of supported programs that will be backed up, with backup for
21 non-supported programs being left to the user. Other alternatives between
22 the two foregoing ones may be arranged.

23 Once the operating system and applications have been installed, the
24 agent 102 then queries storage 103 or server 104 for the user's data and
25 loads it into the local hard disk.

1 In the example shown, the agent program 102 is shown as being
2 resident on the user's computer system, but it could also be located
3 elsewhere, such as on the server. Similarly, the stored backup copies of
4 operating systems and application programs could be on the server, on a
5 separate computer that is not ordinarily connected to the system, on a tape
6 drive, etc.

7 The local support group will make a decision as to how many
8 operating systems and application programs they will support. More than
9 one operating system (e.g. Windows and Linux) and more than one version
10 of an application program, (e.g. Lotus and Microsoft word processors)
11 might be supported. For convenience in the claims, the stored programs
12 will be referred to as a set of programs, meaning one or more members of
13 the set.

14 While the invention has been described in terms of a single preferred
15 embodiment, those skilled in the art will recognize that the invention can be
16 practiced in various versions within the spirit and scope of the following
17 claims.
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